

### **REMARKS**

This Amendment is being filed in response to the Office Action mailed from the U.S. Patent and Trademark Office on April 5, 2006, in which claims 1-24 and 55-84 were rejected. With this Amendment, claims 1, 12, 17-22, 55, 63-65, 68-69, 73 and 78-80 are amended. Thus, Applicants respectfully request reconsideration and allowance of pending claims 1-24 and 55-84.

The Office Action has rejected claims 1-5, 9-10, 12, 15-16, 19-23, 55-57, 60, 64-67, 68-70, 72-75, 77, 79 and 80 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,996,147 to Majumdar et al ("the Majumdar '147 patent"). The Office Action has also rejected claims 8, 13-14, 17-18, 61, 63, 76, 78, and 80-84 under 35 U.S.C. § 103(a) as being obvious over the '147 patent to Majumdar et al. The Office Action has also rejected claims 6, 58 and 71 under 35 U.S.C. § 103(a) as being obvious over the '147 patent to Majumdar et al. in view of U.S. Patent Publication No. 2004/0131537 to Yang. The Office Action has also rejected claims 6, 11, 58-59 and 71 under 35 U.S.C. § 103(a) as being obvious over the '147 patent to Majumdar et al. in view of U.S. Patent No. 6,586,095 to Wang.

With this Amendment, Applicants' independent claim 55 is amended to recite at least three nanostructures attached to the central nanostructure between a first end and a second end of the central nanostructure and independent claims 1, 68 and 80 are amended to recite at least three second metallic oxides are attached to the first metallic oxide between a first end and a second end of the first metallic oxide. Having at least three nanostructures attached to the central nanostructure between a first end and a second end of the central nanostructure is neither disclosed, suggested or made obvious by the Majumdar '147 patent. Thus, reconsideration and allowance of pending claims 1-24 and 55-84 is respectfully requested.

The Office Action states:

Regarding independent claims 1, 55, and 68, Majumdar teaches a nanowire with at least two crystalline materials of different composition creating heterostructures (abstract). The crystalline structures can be oxides such as ZnO or CdO (column 31 line 53-68). The structure form in arrays having a structure as depicted in figures 34-35. The figures depict a central spine (nanowire) with

terminally attached linear nanostructure rods that are oriented non-parallel; as required in claim 1. Regarding claim 55, there are a plurality (two) three dimensional nanostructures attached to the central nanostructure (see figure 35). Regarding claim 68, the first metal oxide has attached to its end a second metal oxide (figure 35).

(Office Action mailed April 5, 2006, page 2).

To anticipate a claim, the reference must teach every element of the claim.

M.P.E.P. 2131. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987); M.P.E.P. 2131. "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); M.P.E.P. 2131.

The Majumdar '147 patent disclosed methods of fabricating nanostructures and nanowires and devices fabricated therefrom. The Office Action focuses on FIG. 34 and FIG. 35 as anticipating Applicants independent claims. In particular, the Office Action states, "Regarding claim 55, there are **a plurality (two)** three dimensional nanostructures attached to the central nanostructure (see figure 35)." (Office Action mailed April 5, 2006, page 2)(emphasis added). Applicants agree with the Office Action statement that the Majumdar '147 patent discloses only two nanostructures attached to a central nanostructure.

Majumdar FIG. 34 and FIG. 35 disclose a 3-terminal device. Majumdar FIG. 34 shows a first embodiment of a 3-terminal nanowire device having a T shape in which terminal T<sub>2</sub> and T<sub>3</sub> extend from an end of terminal T<sub>1</sub>. Majumdar FIG. 35 shows a second embodiment of a 3-terminal nanowire device having a Y shape in which terminal T<sub>2</sub> and T<sub>3</sub> extend from an end of terminal T<sub>1</sub>. ('147 patent, col. 5, lines 42-47). In Majumdar FIG. 34 and FIG. 35, the 3-terminal device "could be utilized with two terminals acting as source and drain and the third acting as a gate." ('147 patent, col. 32, line 65 - col. 33, line 1). In the Majumdar '147 patent, the two terminals are the ends of the nanostructure extending from the central nanowire and the third terminal is an end of the central nanowire. Thus, the Majumdar '147 patent discloses only two nanostructures

extending from and beyond an end of the central nanowire.

With this Amendment, Applicants' independent claim 55 is amended to recite at least three nanostructures attached to the central nanostructure between a first end and a second end of the central nanostructure. In addition, independent claims 1, 68 and 80 are amended to recite at least three second metallic oxides attached to the first metallic oxide between a first end and a second end of the first metallic oxide. Applicants amended the independent claims to recite at least three nanostructures attached to a central nanostructure between a first end and a second end of the central nanostructure. Having at least three nanostructures attached to the central nanostructure between a first end and a second end of the central nanostructure is neither disclosed, suggested or made obvious by the Majumdar '147 patent. Thus, independent claims 1, 55, 68 and 80 contain allowable subject matter and reconsideration and allowance of pending claims 1-24 and 55-84 is respectfully requested.

The Office Action has also rejected claims 8, 13-14, 17-18, 61, 63, 76, 78, and 80-84 under 35 U.S.C. § 103(a) as being obvious over the '147 patent to Majumdar et al. The Office Action has also rejected claims 6, 58 and 71 under 35 U.S.C. § 103(a) as being obvious over the '147 patent to Majumdar et al. in view of U.S. Patent Publication No. 2004/0131537 to Yang.

"Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." M.P.E.P. 2143.01. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000). See also *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); *In re Lee*, 277 F.3d 1338, 1342-44, 61 U.S.P.Q.2d 1430, 1433-44 (Fed. Cir. 2002); *In re Jones*, 958 F.2d 347, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992); M.P.E.P. 2143.01.

With this Amendment, Applicants' have amended independent claims 1, 55, 68 and 80 to recite at least three nanostructures attached to a central nanostructure between a first end and a second end of the central nanostructure. The additional cited reference of the Yang Publication No. 2004/0131537 does not cure or offer a suggestion on how to overcome the deficiencies of the Majumdar '147 patent discussed above. The Yang Publication No. 2004/0131537 discloses functional bimorph composite nanotapes and methods of fabrication. The Office Action described the Yang Publication No. 2004/0131537 as follows: "Yang teaches a nanoribbon used as an actuator that is doped with Tin (abstract)." (Office Action at p. 4). The Yang Publication No. 2004/0131537 does not disclose or suggest at least three nanostructures attached to a central nanostructure. The Majumdar '147 patent in combination with the Yang Publication No. 2004/0131537 does NOT disclose, suggest or make obvious at least three nanostructures attached to a central nanostructure between a first end and a second end of the central nanostructure, and therefore cannot render the claimed invention obvious. Applicants respectfully request reconsideration and withdrawal of the obviousness rejection as it applies to the claims.

The Office Action has also rejected claims 6, 11, 58-59 and 71 under 35 U.S.C. § 103(a) as being obvious over the '147 patent to Majumdar et al. in view of U.S. Patent No. 6,586,095 to Wang ("the Wang '095 patent"). The additional cited reference of the Wang '095 patent does not cure or offer a suggestion on how to overcome the deficiencies of the Majumdar '147 patent discussed above. The Wang '095 patent discloses semiconducting oxide nanostructures. The Office Action described the Wang '095 patent as follows: "Wang teaches a Tin-doped oxide nanostructure where the nanostructured oxide is Indium oxide (ITO) are used as films for flat panel displays (column 1 line 18-28)." (Office Action at p. 5). The Wang '095 patent does not disclose or suggest at least three nanostructures attached to a central nanostructure between a first end and a second end of the central nanostructure. The Majumdar '147 patent in combination with the Wang '095 patent does NOT disclose, suggest or make obvious at least three nanostructures attached to a central nanostructure, and therefore cannot render the claimed invention obvious. Applicants respectfully request reconsideration and withdrawal of the obviousness rejection as it applies to claims 6, 11, 58-59 and 71.

None of the cited prior art references, alone or in combination, disclose, teach, suggest or make obvious at least three nanostructures attached to a central nanostructure between a first end and a second end of the central nanostructure. Thus, Applicants respectfully request reconsideration and allowance of pending claims 1-1-24 and 55-84.

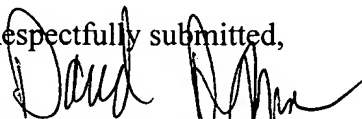
Support for this amendment is found throughout Applicants' specification and drawings as filed, including but not limited to page 5, lines 9-12; page 21, lines 10-19; page 24, line 18 - page 25, line 2, and page 25, lines 3-12 of the specification and FIGS. 2(h), 10(h) and 38(c), among others. No new matter is added with this Amendment.

Applicants respectfully request reconsideration and allowance of pending claims 1-24 and 55-84. Applicants have made an earnest effort to respond to all issues raised in the Office Action of April 5, 2006, and to place all claims presented in condition for allowance. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicants have argued herein that such amendment was made to distinguish over a particular reference or combination of references.

Applicants submit that all claims have been placed in a condition for allowance, and respectfully request an early and favorable action by the Examiner. If the Examiner believes that a telephone conversation with Applicants' attorney would expedite prosecution of this application, the Examiner is cordially invited to call the undersigned attorney of record.

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Respectfully submitted,



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